Questions and Answers for N00173-02-R-AT02 (Amendment 0002)

1. The specifications for the gun of the electron beam source that it be 9 inches long and 5.1 inches wide seems so specific that it sounds like someone has a certain unit in mind. Is there a unit with these exact specifications? Would an evaporation source such as the MDC EV-6000 series be usable even though it is 8.5 inches long but 6.87 inches wide?

The physical dimensions of the gun for the electron beam source can be varied as far as it meets the minimum requirements of the electron beam source listed in the specifications.

2. The same question applies to the chamber itself. It should have an I.D of 20 inches, not say 24 inches? With this quantity of equipment going into the chamber, possible lack of space concerns me.

Contractor is not limited to providing a 20" (Inner diameter) chamber.

3. If I understand the document correctly, the cryo-cooled rotating 10-inch tilting platen (primary holder) must allow for deposition from either side. This means that there will be 4 holes in the platen, each hole slightly less than 3 inches in diameter. The thermal contact between the substrates and the platen will occur along the outer diameter of each substrate, with some kind of clip holding them in. Is this the correct picture?

There will be no holes for samples in the primary holder. Samples will loaded in the front surface of the holder with clips for holding samples.

4. The platen itself is subject to a back and forth motorized rotation (0-30 rpm) about the axis of its 10-inch diameter. The motor performing this motion must be strong enough to bend the associated LN2 lines hooked to the platen. This is correct?

Correct.

5. By saying "cool sample from 77K to ambient, using liquid nitrogen and thermocouple control", I assume you expect that the cooled platen will be designed so that LN2 and heat from the quartz lamp assembly can be applied simultaneously. I see no other way of achieving stable temperatures under thermocouple control between 77K and ambient without a combination of LN2 and heat. Is this what you have in mind? I am concerned that with so little of the substrate in physical contact with the platen, what the thermocouple reads and what the sample experiences may be very different, especially with radiant heat (I am also concerned with how true the thermocouple readings will represent the true temperature of the both-sides-exposed 3 inch wafers just with heating alone).

This specification was revised in the first amendment to this requirement.

6. For the secondary holder, supplying 3 domes with 12 aluminum blocks (acting as heat sinks) on to which the 12 3-inch wafers can be attached by either nesting or spring clips would fulfill the requirement. Yes?

Correct.

6a. The radial center of the dome would coincide with the central e-gun source.

The radial center of the dome will not coincide with the central e-gun source.

7. I am assuming that the two resistance evaporation sources do NOT have to run concurrently, meaning they can share a common external current source with the manual high current source switch connecting them. Correct?

Correct.

8. Is contractor limited to providing a 20" chamber? There seems to be adequate space on the frame to accommodate a larger chamber which would facilitate locating all the devices on the baseplate.

Contractor is not limited to providing a 20" (Inner diameter) chamber.

9. Does the requester really mean for the sample to be cooled to 77K? Our experience leads us to believe this is very difficult under the best conditions and is nearly impossible in a chamber loaded with and E-gun, other sources, substrate holders, planets, etc. Our guess is that the best temperature obtainable is between 110K and 130K. This would be in a static condition; no heaters on, no E-gun and no filaments on.

This specification was revised in the first amendment to this requirement.

10. Does the requester know if a rotating tilting, and LN cooled substrate holder is commercially available? If so, is the manufacture or designers name available to all bidders?

Based on the requester's knowledge, the primary substrate holder is not commercially available.